

NEW YORK STATE COALITION OPPOSED TO FLUORIDATION, INC.  
Participating Member of International Network for Safe Drinking Water  
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March 29, 2000

Docket Management Branch (HFA-305)  
Food and Drug Administration (FDA)  
5630 Fishers Lane, Room 1061  
Rockville, Maryland 20852

Re: Docket No. 97N-0436. Federal Register, 2/22/2000, Vol.65, No. 35, p. 8718-8722  
Food and Drug Administration Draft Study Report;  
Feasibility of Appropriate Methods of Informing Customers  
of the Contents of Bottled Water, as required by the  
Safe Drinking Water Act Amendments

Gentlemen:

It is of great importance for the FDA to require the addition of fluoride content on all bottled waters. Much to your Administration's credit, as of April 1997, poison warning labels are required on all fluoride toothpastes and dental care products:

**"WARNINGS: keep out of the reach of children under 6 years of age.**  
If you accidentally swallow more than used for brushing, seek professional help or contact a poison control center immediately."

The American Dental Association had already cautioned that toothpaste tubes state:  
"Children under 6 yrs.: To minimize swallowing use a pea-sized amount and supervise brushing..."

The FDA acknowledges that adverse reactions due to fluoride occur in toothpaste. Since safety precautions are warranted in toothpastes, it follows that safety precautions are warranted with fluoride in any form, whether in water, toothpastes, supplements, rinses, medications, etc. This especially applies to fluoride in water since no one can reliably analyze a person's degree of thirst, degree of absorption, and individual reactions. Thus, fluoride in water becomes even more likely to cause toxic reactions in the body.

There is an obvious inconsistency on the part of the pro-fluoride people. On the one hand, there have been extensive promotional efforts for the last few years to convince people that bottled water without fluoride, lacks what is needed to reduce tooth decay. On the other hand, the same pro-fluoride people are acknowledging that children are getting too much fluoride from various sources, resulting in dental fluorosis. It is obvious you cannot get too little and too much

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simultaneously. Studies document that the problem to contend with is fluoride excess, not fluoride deficiency.

The visible signs of dental fluorosis are undeniable and have risen disturbingly. The American Dental Association (ADA) apparently felt compelled to take some action. The ADA has again revised their fluoride recommendations downwards. (Vol. 126, 12/95, p. 1622) (Similar revisions were made by the American Academy of Pediatric Dentistry) We enclose the ADA chart which warrants careful analysis. This chart indicates that infants up to age 6 months should receive NO supplementary fluoride, even if the water supply contains no fluoride at all. Therefore, consumption of any fluoridated water can only be viewed as overmedication of infants up to age 6 months. The chart recommends that children from age 6 months to 3 years living in a non-fluoridated area receive no more than 0.25 mg/day of fluoride supplement. This is the amount found in 8 ounces of fluoridated water. Therefore, any child from age 6 months to 3 years who drinks more than one cup of fluoridated water per day is overmedicated. The chart recommends that children age 3 to 6 years living in a non-fluoridated area receive no more than 0.50 mg/day of fluoride supplement. This is the amount found in 16 ounces of fluoridated water. Therefore, any child from age 3 to 6 years who drinks more than 2 cups of fluoridated water per day is overmedicated. These revisions are not familiar to the average person.

Adequate information and labeling on fluoride is necessary. A few examples from recognized journals and sources follow:

In July 1997, the Journal of the American Dental Association reported that baby foods are too high in fluoride, such as chicken, dry infant cereals, etc. ("Can Your Child Be Getting Too Much Fluoride Through Baby Food?" ADA News Release). Total fluoride intake could reach approximately five milligrams daily or more. This amount is easily reached because of our heavily fluoridated country, the resulting fluoridated food and beverage chain, medications, toothpastes, rinses, drops, pesticides, fertilizers, and more. Fluoride is even breathed in from humidifiers in fluoridated areas. (One milligram of fluoride daily is the amount recommended by proponents of fluoridation/fluoride). Total fluoride intake is out of control.

Fluoride is cumulative and children store up even more fluoride than adults, especially during their tender years of skeletal growth. Parents are misled to believe they can freely give their babies and older children fluoride in their water, in their food, and in their supplements. They are not told about adverse effects of fluoride reported in the U.S. Pharmacopeia (USP), Physicians Desk Reference (PDR), and numerous medical studies.

An important article was published on "Preventive Dental Care: The Role of the Pediatrician" by Henry J. Herrmann, DMD, and Michael W. Roberts, DDS, (Pediatrics, Vol. 80, July 1987). Among numerous cautions were:

"...Systemic fluoride supplements should be prescribed when needed but only after a careful review of requirements and daily consumption..." "The amounts of fluoride being ingested from all sources must be determined prior to prescribing supplements... These requirements should be adjusted downward for the significantly underweight child (emphasis added)...." As pointed out earlier, and as well documented, **total fluoride intake is difficult if not impossible to estimate or control.**

The Journal of the American Dental Association (JADA), 4/88, published a report by Heifetz, Driscoll, Horowitz, and Kingman on a 5 year survey. They stated in part:

"Because more foods and beverages are being processed in fluoridated communities and use of various fluoride vehicles for caries prevention has become widespread, there is concern that the ingestion of fluoride has significantly increased, with a concomitant increase in dental fluorosis..." "At twice the optimal fluoride concentration, the additional intake from extraneous sources of fluoride could be approaching a critical threshold for producing severe fluorosis.....It might be that the margin of safety between optimal water-fluoride concentrations and higher-than-optimal concentrations, while always small, could have become much smaller..."

The New York State Dental Journal (NYSDJ), 2/98, published a report by Drs. Kumar and Green of the New York State Health Department, comparing fluoridated Newburgh with unfluoridated Kingston, New York. They stated in part,

"The potential for exposure to multiple sources of fluoride has increased. Therefore, practitioners should prescribe fluoride therapy based on an understanding of patients' total exposure to fluoride..."

The Journal of the American Dental Association (JADA), 11/99, published a report, "Assessing Fluoride Levels of Carbonated Soft Drinks" by Heilman, et al., in which it stated:

"...If product labels do not provide information on fluoride concentrations or at least the production site, it is not possible for consumers or health care professionals to estimate directly the amount of fluoride ingested from carbonated beverages."

Wall Street Journal reporter Tara Parker Pope (12/21/98) in an article, "Some Young Children Get Too Much Fluoride in Caring for Teeth," stated: "The CDC also wants doctors and dentists to get a better idea of a child's eating and drinking habits before prescribing supplements. ...The CDC is calling for new labeling rules requiring manufacturers to list a product's fluoride content." (emphasis added)

We submitted our comments to the FDA on November 11, 1988 regarding your Docket No. 86N-0445, Quality Standards for Foods with No Identity Standards: Bottled Water." We proposed that fluoride occurring naturally in bottled water should be removed, so that the fluoride level is zero; and that fluoride should not be permitted to be intentionally added to bottled water at any level. Our position was based on science regarding health risks, concern about total fluoride exposure, and the position that drinking water should not be used to treat a medical (or dental) condition, rather than for purposes of purification and potability.

Since our submission on November 11, 1988, the scientific evidence has mounted on the hazards and failure of fluoridation and fluoride methods. Still more evidence has come to the foreground of fluoride's accumulation in the brain as well as the bones and other cells and organs of the body. Evidence has been published in peer-reviewed journals of the increase in hip fractures in the elderly, osteosarcoma in young males, and adverse effect on the central nervous system and brain function in both animal and human studies.

There is strong dissension among scientists, even at the highest levels of government, over fluoridation's safety and effectiveness. On July 1, 1997, the U.S. Environmental Protection Agency's (EPA) union of scientists at Headquarters in Washington, voted unanimously to take a stand against fluoridation. They have based their opposition to fluoridation on the significant scientific evidence showing a "causal link between fluoride/fluoridation and cancer, genetic dosage, neurological impairment and bone pathology." They stated, "there is virtually no evidence of significant benefits...and substantial evidence of adverse health effects." They have reiterated their position since that time. These are the conclusions from EPA professionals who are charged with assessing the safety of drinking water!

Physicians and dentists are being advised to take total fluoride into account, from water, from foods and beverages processed in fluoridated areas, etc. While this advice is difficult to adequately carry out under any circumstances, obviously it makes compliance impossible if bottled water gives no indication of the fluoride content.

Even without taking sides in the controversy, it should be clear that caution should be the ruling factor, informed consent, and the public's Right to Know. It is clear that an individual cannot make an informed judgment without adequate information

We are in favor of a "combination approach" as described in your Federal Register. However, fluoride content should be included on the bottled label itself, with supplementary information made available to consumers who desire it, by listing manufacturer's address and telephone number. The consumer should see at a glance on the bottled water the information they are either interested in, or that should be made available to them. While there is merit to the idea of having descriptive flyers of bottled water products made available to pharmacies and retailers for distribution to customers, this does not replace the need to include the fluoride content on the label itself, which is far more certain.

March 29, 2000


While voluntary cautions are helpful, a ruling is necessary. We would far prefer that fluoride not be permitted in bottled water, but while it is permitted, the FDA should require all bottled water manufacturers, bottlers, and distributors, to include the following on the label of the bottle:

- (1) the source of the water, whether from a fluoridated or non-fluoridated areas,
- (2) the amount of fluoride contained in the bottled water.
- (3) the name and telephone number of manufacturer or distributor for inquiries by concerned consumers.

With both proponents and opponents of fluoridation of public water supplies concerned about the increased dental fluorosis (damage to youngsters's teeth), the FDA should have no difficulty approving the proposals we have presented. By listing fluoride content on bottled water labels, this should accommodate both sides of the argument: those who seek fluoride, and those who wish to avoid fluoride. The consumer would then have the privilege of making their individual decision, based on accuracy and adequacy in labeling.

Respectfully submitted,

NEW YORK STATE COALITION  
OPPOSED TO FLUORIDATION, INC.

BY:   
Evelyn Hannan  
Environmental Chairman

Encls.

- (1) Excerpts from "Toxicological Profile For Fluorides..." (U.S. Public Health Service (USPHS), 4/93, p.112): "Existing data indicate that subsets of the population may be unusually susceptible to the toxic effects of fluoride and its compounds. These populations include the elderly, people with deficiencies of calcium, magnesium, and/or vitamin C, and people with cardiovascular and kidney problems."
- (2) Statement "Why the Union Representing U.S. EPA's Professionals in Washington, D.C. Opposes Fluoridation", May 1, 1999.
- (3) Revised Fluoride Supplementation Schedule, JADA, Vol. 126, 12/95, p.1622;
- (4) "Can Your Child be Getting Too Much Fluoride Through Baby Food?", ADA, 6-7/97;
- (5) Excerpts from *Journal of American Dental Association* (JADA), 11/99 "Assessing Fluoride Levels Of Carbonated Soft Drinks" by Heilman, et al. (one of numerous reports)
- (6) JADA Abstracts, 12/95:  
"Risk of Fluorosis in a Fluoridated Population...", by David Pendrys, D.D.S., Ph.D.;  
"Infants' Fluoride Ingestion from Water, Supplements and Dentifrices" by Levy, et al.
- (7) "Trends in prevalence of dental fluorosis..." Community Dent Oral Epidemiol 6/94.
- (8) "Startling New Evidence of Fluoride's Toxicity" -- Research reported at the Conference of the International Society for Fluoride Research (ISFR), 8/98, Bellingham, Washington.
- (9) Scientific references by Dr. David Kennedy, DDS & Citizens for Safe Drinking Water;
- (10) "America Over-Dosed on Fluoride" compiled by Fluoride Committee, PA.

**Toxicological  
Profile  
for**

**FLUORIDES, HYDROGEN  
FLUORIDE, AND FLUORINE (F)**

**U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES**  
Public Health Service  
Agency for Toxic Substances and Disease Registry

(April 1993)

**TP-91/17**

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(OVER)

# HEALTH EFFECTS OF FLUORIDE

## EXCERPTS FROM

### "TOXICOLOGICAL PROFILE FOR FLUORIDES, HYDROGEN FLUORIDE, AND FLUORINE (F)"

U.S. Public Health Service, U.S. Department of Health & Human Services (April, 1993)

"Existing data indicate that subsets of the population may be unusually susceptible to the toxic effects of fluoride and its compounds. These populations include the elderly, people with deficiencies of calcium, magnesium, and/or vitamin C, and people with cardiovascular and kidney problems."

"Because fluoride is excreted through the kidney, people with renal insufficiency would have impaired renal clearance of fluoride. . . . Impaired renal clearance of fluoride has also been found in people with diabetes mellitus and cardiac insufficiency. People over the age of 50 often have decreased renal clearance. . . . This decreased clearance of fluoride may indicate that elderly people are more susceptible to fluoride toxicity." (Emphasis added.)

"Poor nutrition increases the incidence and severity of dental fluorosis." (Page 112) "Epidemiological evidence exists that the incidence and severity of fluorosis has increased in the United States." (Page 122) (Note: Up to 80% of young children in fluoridated areas now have dental fluorosis, according to the *Journal of the American Dental Association*, December, 1995.)

"Some people with cardiovascular problems may be at increased risk of fluoride toxicity."

"No experiments have studied developmental effects of fluoride using standard testing methods."  
(Emphasis added.)

"A large study of fluoride conducted by the National Toxicology Program with both rats and mice found that a small number of male rats developed bone cancer (osteosarcoma) after drinking water with high levels of fluoride in it throughout their lives. . . . The bone cancer seen in the rat study is rare in humans, although its frequency has recently increased among males in countries with fluoridated water." (Page 6) "The osteosarcoma rate in males living in fluoridated areas has increased markedly in recent years . . ." (Page 123)

"The main health concern regarding sodium fluoride is likely to be from chronic oral exposure in drinking water." (Emphasis supplied.)

"Recent studies indicate that fluoride may increase the rate of hip fractures in elderly men and women."

"Environmental Fate. . . More information on biotransformation by plants would be useful in developing a more complete understanding of the environmental fate of fluoride. (Ed. note: This means knowledge regarding environmental fluoride is unknown due to total lack of research.) . . . Food Chain Bioaccumulation. Fluorides have been shown to accumulate in animals that consume fluoride-containing foliage. . . . Information on bioconcentration in terrestrial and aquatic organisms and biomagnification in food chains would be helpful in assessing the importance of bioaccumulation as a route of human exposure."



# NTEU

**The National Treasury Employees Union**

## CHAPTER 280

P.O. BOX 76082 WASHINGTON, DC 20013

202-260-2383(V)

202-401-3139(F)

May 1, 1999

### ***WHY EPA'S HEADQUARTERS UNION OF SCIENTISTS OPPOSES FLUORIDATION***

The following documents why our union, formerly National Federation of Federal Employees Local 2050 and since April 1998 Chapter 280 of the National Treasury Employees Union, took the stand it did opposing fluoridation of drinking water supplies. Our union is comprised of and represents the approximately 1500 scientists, lawyers, engineers and other professional employees at EPA Headquarters here in Washington, D.C.

The union first became interested in this issue rather by accident. Like most Americans, including many physicians and dentists, most of our members had thought that fluoride's only effects were beneficial - reductions in tooth decay, etc. We too believed assurances of safety and effectiveness of water fluoridation .

Then, as EPA was engaged in revising its drinking water standard for fluoride in 1985, an employee came to the union with a complaint: he said he was being forced to write into the regulation a statement to the effect that EPA thought it was alright for children to have "funky" teeth. It was OK, EPA said, because it considered that condition to be only a *cosmetic* effect, not an adverse *health* effect. The reason for this EPA position was that it was under political pressure to set its health-based standard for fluoride at 4 mg/liter. At that level, EPA knew that a significant number of children develop moderate to severe dental fluorosis, but since it had deemed the effect as only cosmetic, EPA didn't have to set its health-based standard at a lower level to prevent it.

We tried to settle this ethics issue quietly, within the family, but EPA was unable or unwilling to resist external political pressure, and we took the fight public with a union *amicus curiae* brief in a lawsuit filed against EPA by a public interest group. The union has published on this initial involvement period in detail.\1

Since then our opposition to drinking water fluoridation has grown, based on the scientific literature documenting the increasingly out-of-control exposures to fluoride, the lack of benefit to dental health from ingestion of fluoride and the hazards to human health from such ingestion. These hazards include acute toxic hazard, such as to people with

impaired kidney function, as well as chronic toxic hazards of gene mutations, cancer, reproductive effects, neurotoxicity, bone pathology and dental fluorosis. First, a review of recent neurotoxicity research results.

In 1995, Mullenix and co-workers <sup>2</sup> showed that rats given fluoride in drinking water at levels that give rise to plasma fluoride concentrations in the range seen in humans suffer neurotoxic effects that vary according to when the rats were given the fluoride - as adult animals, as young animals, or through the placenta before birth. Those exposed before birth were born hyperactive and remained so throughout their lives. Those exposed as young or adult animals displayed depressed activity. Then in 1998, Guan and co-workers <sup>3</sup> gave doses similar to those used by the Mullenix research group to try to understand the mechanism(s) underlying the effects seen by the Mullenix group. Guan's group found that several key chemicals in the brain - those that form the membrane of brain cells - were substantially depleted in rats given fluoride, as compared to those who did not get fluoride.

Another 1998 publication by Varner, Jensen and others <sup>4</sup> reported on the brain- and kidney damaging effects in rats that were given fluoride in drinking water at the same level deemed "optimal" by pro-fluoridation groups, namely 1 part per million (1 ppm). Even more pronounced damage was seen in animals that got the fluoride in conjunction with aluminum. These results are especially disturbing because of the low dose level of fluoride that shows the toxic effect in rats - rats are more resistant to fluoride than humans. This latter statement is based on Mullenix's finding that it takes substantially more fluoride in the drinking water of rats than of humans to reach the same fluoride level in plasma. It is the level in plasma that determines how much fluoride is "seen" by particular tissues in the body. So when rats get 1 ppm in drinking water, their brains and kidneys are exposed to much less fluoride than humans getting 1 ppm, yet they are experiencing toxic effects. Thus we are compelled to consider the likelihood that humans are experiencing damage to their brains and kidneys at the "optimal" level of 1 ppm.

In support of this concern are results from two epidemiology studies from China <sup>5,6</sup> that show decreases in I.Q. in children who get more fluoride than the control groups of children in each study. These decreases are about 5 to 10 I.Q. points in children aged 8 to 13 years.

Another troubling brain effect has recently surfaced: fluoride's interference with the function of the brain's pineal gland. The pineal gland produces melatonin which, among other roles, mediates the body's internal clock, doing such things as governing the onset of puberty. Jennifer Luke <sup>7</sup> has shown that fluoride accumulates in the pineal gland and inhibits its production of melatonin. She showed in test animals that this inhibition causes an earlier onset of sexual maturity, an effect reported in humans as well in 1956, as part of the Kingston/Newburgh study, which is discussed below. In fluoridated

Newburgh, young girls experienced earlier onset of menstruation (on average, by six months) than girls in non-fluoridated Kingston \8.

From a risk assessment perspective, all these brain effect data are particularly compelling and disturbing because they are convergent.

We looked at the cancer data with alarm as well. There are epidemiology studies that are convergent with whole-animal and single-cell studies (dealing with the cancer hazard), just as the neurotoxicity research just mentioned all points in the same direction. EPA fired the Office of Drinking Water's chief toxicologist, Dr. William Marcus, who also was our local union's treasurer at the time, for refusing to remain silent on the cancer risk issue\9. The judge who heard the lawsuit he brought against EPA over the firing made that finding - that EPA fired him over his fluoride work and not for the phony reason put forward by EPA management at his dismissal. Dr. Marcus won his lawsuit and is again at work at EPA. Documentation is available on request.

The type of cancer of particular concern with fluoride, although not the only type, is osteosarcoma, especially in males. The National Toxicology Program conducted a two-year study \10 in which rats and mice were given sodium fluoride in drinking water. The positive result of that study (in which malignancies in tissues other than bone were also observed), particularly in male rats, is convergent with a host of data from tests showing fluoride's ability to cause mutations (a principal "trigger" mechanism for inducing a cell to become cancerous) e.g.\11a, b, c, d and data showing increases in osteosarcomas in young men in New Jersey \12, Washington and Iowa \13 based on their drinking fluoridated water. It was his analysis, repeated statements about all these and other incriminating cancer data, and his requests for an independent, unbiased evaluation of them that got Dr. Marcus fired.

Bone pathology other than cancer is a concern as well. An excellent review of this issue was published by Diesendorf et al. in 1997 \14. Five epidemiology studies have shown a higher rate of hip fractures in fluoridated vs. non-fluoridated communities. \15a, b, c, d, e. Crippling skeletal fluorosis was the endpoint used by EPA to set its primary drinking water standard in 1986, and the ethical deficiencies in that standard setting process prompted our union to join the Natural Resources Defense Council in opposing the standard in court, as mentioned above.

Regarding the effectiveness of fluoride in reducing dental cavities, there has not been any double-blind study of fluoride's effectiveness as a caries preventative. There have been many, many small scale, selective publications on this issue that proponents cite to justify fluoridation, but the largest and most comprehensive study, one done by dentists trained by the National Institute of Dental Research, on over 39,000 school children aged 5-17 years, shows no significant differences (in terms of decayed, missing

and filled teeth) among caries incidences in fluoridated, non-fluoridated and partially fluoridated communities. \16. The latest publication \17 on the fifty-year fluoridation experiment in two New York cities, Newburgh and Kingston, shows the same thing. The only significant difference in dental health between the two communities as a whole is that fluoridated Newburgh, N.Y. shows about twice the incidence of dental fluorosis (the first, visible sign of fluoride chronic toxicity) as seen in non-fluoridated Kingston.

John Colquhoun's publication on this point of efficacy is especially important \18. Dr. Colquhoun was Principal Dental Officer for Auckland, the largest city in New Zealand, and a staunch supporter of fluoridation - until he was given the task of looking at the world-wide data on fluoridation's effectiveness in preventing cavities. The paper is titled, "Why I changed My Mind About Water Fluoridation." In it Colquhoun provides details on how data were manipulated to support fluoridation in English speaking countries, especially the U.S. and New Zealand. This paper explains why an ethical public health professional was compelled to do a 180 degree turn on fluoridation.

Further on the point of the tide turning against drinking water fluoridation, statements are now coming from other dentists in the pro-fluoride camp who are starting to warn that topical fluoride (e.g. fluoride in tooth paste) is the only significantly beneficial way in which that substance affects dental health \19, \20, \21. However, if the concentrations of fluoride in the oral cavity are sufficient to inhibit bacterial enzymes and cause other bacteriostatic effects, then those concentrations are also capable of producing adverse effects in mammalian tissue, which likewise relies on enzyme systems. This statement is based not only on common sense, but also on results of mutation studies which show that fluoride can cause gene mutations in mammalian and lower order tissues at fluoride concentrations estimated to be present in the mouth from fluoridated tooth paste \22. Further, there were tumors of the oral cavity seen in the NTP cancer study mentioned above, further strengthening concern over the toxicity of topically applied fluoride.

In any event, a person can choose whether to use fluoridated tooth paste or not (although finding non-fluoridated kinds is getting harder and harder), but one cannot avoid fluoride when it is put into the public water supplies.

So, in addition to our concern over the toxicity of fluoride, we note the uncontrolled - and apparently uncontrollable - exposures to fluoride that are occurring nationwide via drinking water, processed foods, fluoride pesticide residues and dental care products. A recent report in the lay media \23, that, according to the Centers for Disease Control, at least 22 percent of America's children now have dental fluorosis, is just one indication of this uncontrolled, excess exposure. The finding of nearly 12 percent incidence of dental fluorosis among children in un-fluoridated Kingston New York \17 is another. For governmental and other organizations to continue to push for *more* exposure

in the face of current levels of over-exposure coupled with an increasing crescendo of adverse toxicity findings is irrational and irresponsible at best.

Thus, we took the stand that a policy which makes the public water supply a vehicle for disseminating this toxic and prophylactically useless (via ingestion, at any rate) substance is wrong.

We have also taken a direct step to protect the employees we represent from the risks of drinking fluoridated water. We applied EPA's risk control methodology, the Reference Dose, to the recent neurotoxicity data. The Reference Dose is the daily dose, expressed in milligrams of chemical per kilogram of body weight, that a person can receive over the long term with reasonable assurance of safety from adverse effects. Application of this methodology to the Varner et al.<sup>14</sup> data leads to a Reference Dose for fluoride of 0.000007 mg/kg-day. Persons who drink about one quart of fluoridated water from the public drinking water supply of the District of Columbia while at work receive about 0.01mg/kg-day from that source alone. This amount of fluoride is more than 100 times the Reference Dose. On the basis of these results the union filed a grievance, asking that EPA provide un-fluoridated drinking water to its employees.

The implication for the general public of these calculations is clear. Recent, peer-reviewed toxicity data, when applied to EPA's standard method for controlling risks from toxic chemicals, require an immediate halt to the use of the nation's drinking water reservoirs as disposal sites for the toxic waste of the phosphate fertilizer industry<sup>24</sup>.

This document was prepared on behalf of the National Treasury Employees Union Chapter 280 by Chapter Senior Vice-President J. William Hirzy, Ph.D. For more information please call Dr. Hirzy at 202-260-4683. His E-mail address is <hirzy.john@epa.gov>

#### **END NOTE LITERATURE CITATIONS**

1. Applying the NAEP code of ethics to the Environmental Protection Agency and the fluoride in drinking water standard. Carton, R.J. and Hirzy, J.W. *Proceedings of the 23rd Ann. Conf. of the National Association of Environmental Professionals. 20-24 June, 1998.* GEN 51-61. On-line at URL <http://www.rvi.net/~fluoride/naep.htm>

2. Neurotoxicity of sodium fluoride in rats. Mullenix, P.J., Denbesten, P.K., Schunior, A. and Kernan, W.J. *Neurotoxicol. Teratol.* 17 169-177 (1995)
3. Influence of chronic fluorosis on membrane lipids in rat brain. Z.Z. Guan, Y.N. Wang, K.Q. Xiao, D.Y. Dai, Y.H. Chen, J.L. Liu, P. Sindelar and G. Dallner, *Neurotoxicology and Teratology* 20 537-542 (1998).
4. Chronic administration of aluminum- fluoride or sodium-fluoride to rats in drinking water: alterations in neuronal and cerebrovascular integrity. Varner, J.A., Jensen, K.F., Horvath, W. And Isaacson, R.L. *Brain Research* 784 284-298 (1998).
5. Effect of high fluoride water supply on children's intelligence. Zhao, L.B., Liang, G.H., Zhang, D.N., and Wu, X.R. *Fluoride* 29 190-192 (1996)
- 6.. Effect of fluoride exposure on intelligence in children. Li, X.S., Zhi, J.L., and Gao, R.O. *Fluoride* 28 (1995).
7. Effect of fluoride on the physiology of the pineal gland. Luke, J.A. *Caries Research* 28 204 (1994).
8. Newburgh-Kingston caries-fluorine study XIII. Pediatric findings after ten years. Schlesinger, E.R., Overton, D.E., Chase, H.C., and Cantwell, K.T. *JADA* 52 296-306 (1956).
9. Memorandum dated May 1, 1990. *Subject:* Fluoride Conference to Review the NTP Draft Fluoride Report; *From:* Wm. L. Marcus, Senior Science Advisor ODW; *To:* Alan B. Hais, Acting Director Criteria & Standards Division ODW.
10. Toxicology and carcinogenesis studies of sodium fluoride in F344/N rats and B6C3F<sub>1</sub> mice. *NTP Report No. 393* (1991).
- 11a. Chromosome aberrations, sister chromatid exchanges, unscheduled DNA synthesis and morphological neoplastic transformation in Syrian hamster embryo cells. Tsutsui et al. *Cancer Research* 44 938-941 (1984).
- 11b. Cytotoxicity, chromosome aberrations and unscheduled DNA synthesis in cultured human diploid fibroblasts. Tsutsui et al. *Mutation Research* 139 193-198 (1984).
- 11c. Positive mouse lymphoma assay with and without S-9 activation; positive sister chromatid exchange in Chinese hamster ovary cells with and without S-9 activation; positive chromosome aberration without S-9 activation. Toxicology and carcinogenesis studies of sodium fluoride in F344/N rats and B6C3F<sub>1</sub> mice. *NTP Report No. 393* (1991).

11d. An increase in the number of Down's syndrome babies born to younger mothers in cities following fluoridation. *Science and Public Policy* 12 36-46 (1985).

12. A brief report on the association of drinking water fluoridation and the incidence of osteosarcoma among young males. Cohn, P.D. *New Jersey Department of Health* (1992).

13. Surveillance, epidemiology and end results (SEER) program. National Cancer Institute in *Review of fluoride benefits and risks*. Department of Health and Human Services. F1-F7 (1991).

14. New evidence on fluoridation. Diesendorf, M., Colquhoun, J., Spittle, B.J., Everingham, D.N., and Clutterbuck, F.W. *Australian and New Zealand J. Public Health* 21 187-190 (1997).

15a. Regional variation in the incidence of hip fracture: U.S. white women aged 65 years and older. Jacobsen, S.J., Goldberg, J., Miles, T.P. et al. *JAMA* 264 500-502 (1990)

15b. Hip fracture and fluoridation in Utah's elderly population. Danielson, C., Lyon, J.L., Egger, M., and Goodenough, G.K. *JAMA* 268 746-748 (1992).

15c. The association between water fluoridation and hip fracture among white women and men aged 65 years and older: a national ecological study. Jacobsen, S.J., Goldberg, J., Cooper, C. and Lockwood, S.A. *Ann. Epidemiol.* 2 617-626 (1992).

15d. Fluorine concentration in drinking water and fractures in the elderly [letter]. Jacqmin-Gadda, H., Commenges, D. and Dartigues, J.F. *JAMA* 273 775-776 (1995).

15e. Water fluoridation and hip fracture [letter]. Cooper, C., Wickham, C.A.C., Barker, D.J.R. and Jacobson, S.J. *JAMA* 266 513-514 (1991).

16. Water fluoridation and tooth decay: Results from the 1986-1987 national survey of U.S. school children. Yiamouyannis, J. *Fluoride* 23 55-67 (1990).

17. Recommendations for fluoride use in children. Kumar, J.V. and Green, E.L. *New York State Dent. J.* (1998) 40-47.

18. Why I changed my mind about water fluoridation. Colquhoun, J. *Perspectives in Biol. And Medicine* 41 1-16 (1997).

19. A re-examination of the pre-eruptive and post-eruptive mechanism of the anti-caries effects of fluoride: is there any anti-caries benefit from swallowing fluoride? Limeback, H. *Community Dent. Oral Epidemiol.* 27 62-71 (1999).

20. Fluoride supplements for young children: an analysis of the literature focussing on benefits and risks. Riordan, P.J. *Community Dent. Oral Epidemiol.* 27 72-83 (1999).
21. Prevention and reversal of dental caries: role of low level fluoride. Featherstone, J.D. *Community Dent. Oral Epidemiol.* 27 31-40 (1999).
22. Appendix H. *Review of fluoride benefits and risks*. Department of Health and Human Services. H1-H6 (1991).
23. Some young children get too much fluoride. Parker-Pope, T. *Wall Street Journal* Dec. 21, 1998.
24. Letter from Rebecca Hanmer, Deputy Assistant Administrator for Water, to Leslie Russell re: EPA view on use of by-product fluosilicic (sic) acid as low cost source of fluoride to water authorities. March 30, 1983.

**OTHER CITATIONS (This short list does not include the entire literature on fluoride effects)**

- a. Exposure to high fluoride concentrations in drinking water is associated with decreased birth rates. Freni, S.C. J. *Toxicol. Environ. Health* 42 109-121 (1994)
- b. Ameliorative effects of reduced food-borne fluoride on reproduction in silver foxes. Eckerlin, R.H., Maylin, G.A., Krook, L., and Carmichael, D.T. *Cornell Vet.* 78 75-91 (1988).
- c. Milk production of cows fed fluoride contaminated commercial feed. Eckerlin, R.H., Maylin, G.A., and Krook, L. *Cornell Vet.* 76 403-404 (1986).
- d. Maternal-fetal transfer of fluoride in pregnant women. Calders, R., Chavine, J., Fermanian, J., Tortrat, D., and Laurent, A.M. *Biol. Neonate* 54 263-269 (1988).
- e. Effects of fluoride on screech owl reproduction: teratological evaluation, growth, and blood chemistry in hatchlings. Hoffman, D.J., Pattee, O.H., and Wiemeyer, S.N. *Toxicol. Lett.* 26 19-24 (1985).
- f. Fluoride intoxication in dairy calves. Maylin, G.A., Eckerlin, R.H., and Krook, L. *Cornell Vet.* 77 84-98 (1987).
- g. Fluoride inhibition of protein synthesis. Holland, R.I. *Cell Biol. Int. Rep.* 3 701-705 (1979).

- h. An unexpectedly strong hydrogen bond: ab initio calculations and spectroscopic studies of amide-fluoride systems. Emsley, J., Jones, D.J., Miller, J.M., Overill, R.E. and Waddilove, R.A. *J. Am. Chem. Soc.* 103 24-28 (1981).
- i. The effect of sodium fluoride on the growth and differentiation of human fetal osteoblasts. Song, X.D., Zhang, W.Z., Li, L.Y., Pang, Z.L., and Tan, Y.B. *Fluoride* 21 149-158 (1988).
- j. Modulation of phosphoinositide hydrolysis by NaF and aluminum in rat cortical slices. Jope, R.S. *J. Neurochem.* 51 1731-1736 (1988).
- k. The crystal structure of fluoride-inhibited cytochrome c peroxidase. Edwards, S.L., Poulos, T.L., Kraut, J. *J. Biol. Chem.* 259 12984-12988 (1984).
- l. Intracellular fluoride alters the kinetic properties of calcium currents facilitating the investigation of synaptic events in hippocampal neurons. Kay, A.R., Miles, R., and Wong, R.K.S. *J. Neurosci.* 6 2915-2920 (1986).
- m. Fluoride intoxication: a clinical-hygienic study with a review of the literature and some experimental investigations. Roholm, K. H.K. Lewis Ltd (London) (1937).
- n. Toxin-induced blood vessel inclusions caused by the chronic administration of aluminum and sodium fluoride and their implications for dementia. Isaacson, R.L., Varner, J.A., and Jensen, K. F. *Ann. N.Y. Acad. Sci.* 825 152-166 (1997).
- o. Allergy and hypersensitivity to fluoride. Spittle, B. *Fluoride* 26 267-273 (1993)

IF WATER IS NOT  
FLUORIDATED:



## INTERVENTION: FLUORIDE SUPPLEMENTATION

**INDICATIONS:** Children 6 months to 16 years of age living in areas with less than optimally fluoridated water, for example, home or "primary" water supply is fluoride deficient.

ADA Council on Scientific Affairs Recommendations, new dosage schedule approved April 1994:

AGE	FLUORIDE ION LEVEL IN DRINKING WATER (ppm)*		
	<0.3 ppm	0.3-0.6 ppm	>0.6 ppm
Birth-6 months	None	None	None
6 months-3 years	0.25 mg/day†	None	None
3-6 years	0.50 mg/day	0.25 mg/day	None
6-16 years	1.0 mg/day	0.50 mg/day	None

\* 1.0 ppm = 1 mg/liter

† 2.2 mg sodium fluoride contains 1 mg fluoride ion.

**ADVANTAGES:** Permits early exposure, which maximizes protection. Fluoride supplements are sold in two forms: drops for infants age 6 months and up, and chewable tablets for children and adolescents. Systemic and topical benefits when chewed, swished and swallowed. Caries protection from 6 months of age when used as recommended.

**LIMITATIONS:** All sources of fluoride must be evaluated with a thorough fluoride history. If fluoride level is unknown, drinking water must be tested for fluoride content before supplements are prescribed. For testing of fluoride content, contact the local or state health department. Requires long-term compliance on a daily basis. Ingestion of higher than recommended levels of fluoride by children has been associated with an increase in mild dental fluorosis in developing, unerupted teeth. Patient exposure to multiple water sources can make proper prescribing complex.

### CONSIDERATIONS:

**TOOTH:** Caries reduction benefits must be balanced with risk for mild and very mild fluorosis.

**PATIENT:** Home water filtration systems may remove fluoride, therefore, treated water should be tested. Other sources of fluoride need to be determined, including fluoride prescribed by a physician. (Refer to Figure 5.)

**REFERENCES:** American Dental Association, Council on Scientific Affairs, Association Report on Dietary Fluoride Supplements. JADA 1995 (In press).

## ADA News Release

June/July 1997

**Contact:**

ADA Department of Media Relations & Creative Services

312/440-2806

### Can Your Child Be Getting Too Much Fluoride Through Baby Food?

**CHICAGO** — New research suggests young children may be getting more fluoride than they need through baby foods, according to a study published in the July issue of the The Journal of the American Dental Association.

"Our main concern is that these young children could be at increased risk for mild to moderate dental fluorosis by ingesting too much fluoride," says Steven M. Levy, D.D.S., one of the authors of the JADA study from the College of Dentistry at the University of Iowa. "It's important for parents to know how much fluoride their children are getting, whether it's through the water supply, fluoride supplements, fluoridated toothpaste or baby food."

Fluorosis is a mild to moderate cosmetic defect that occurs when more than an optimal amount of fluoride is ingested. The result of mild fluorosis is light spots on permanent teeth that develop while the teeth are still forming.

The researchers analyzed the fluoride concentration of 238 commercially available infant foods. They took samples for analysis from 206 ready-to-eat infant foods and 32 dry infant cereals, which they prepared with water according to the manufacturer's directions.

The results of the analysis reveal ready-to-eat foods with chicken had the highest fluoride concentrations.

One of the reasons for the high fluoride concentrations in infant foods with chicken may be because of the processing method, according to the study. The mechanical deboning process may leave skin and residual bone particles in the food. Much of fluoride is stored in bone; therefore, the higher concentrations in the chicken-containing products.

The researchers also found that dry infant cereals that are reconstituted with fluoridated water may noticeably increase the levels of fluoride in a child's daily intake.

"What we found in this study is fluoride concentrations for the majority of all the products tested varied widely because of the different water sources used to process the foods," Dr. Levy explains. "The differences can be traced to the manufacturing sites that use a fluoridated municipal water supply as compared to a non-fluoridated city or well water."

The American Dental Association reminds consumers that drinking water fluoridated at the recommended level or eating foods prepared or processed with fluoridated water is safe and effective. Studies show that community water fluoridation is the single most effective public health measure we have to prevent tooth decay and improve oral health for a lifetime.

# ASSESSING FLUORIDE LEVELS OF CARBONATED SOFT DRINKS

JUDY R. HEILMAN, B.S.; MARY C. KIRITSY, M.SC., R.D.; STEVEN M. LEVY, D.D.S., M.P.H.;  
JAMES S. WEFEL, PH.D.

## ABSTRACT

**Background.** Dental fluorosis occurs as a result of excessive total fluoride intake during tooth development. Some children may receive substantial intake from soft drinks, but few studies have reported fluoride levels in soft drinks. The authors examined the fluoride concentrations of 332 soft drinks.

**Methods.** Soft drinks were purchased from Iowa grocery stores. To identify production sites, the authors recorded product details and batch numbers. After decarbonating the drinks, the authors assayed samples for fluoride content using a fluoride ion-specific electrode, and reported the results in parts per million, or ppm, using appropriate standards and duplicate assessments. Descriptive statistics were used to summarize the findings.

**Results.** The fluoride levels of the products ranged from 0.02 to 1.28 ppm, with a mean level of 0.72 ppm. Fluoride levels exceeded 0.60 ppm for 71

percent of the products. Results varied substantially by production site, even within the same company and for the same product. There were no substantial differences between flavors or between diet and regular soft drinks.

**Conclusions.** The majority of soft drinks had fluoride levels exceeding 0.60 ppm. Variation in fluoride levels probably is due largely to the different water sources used in production.

**Clinical Implications.** With no fluoride levels marked on the soft drink products or easily available from the manufacturers, it is not possible for clinicians or consumers to directly estimate fluoride ingestion from carbonated beverages. Therefore, to reduce the risk of dental fluorosis, dental and medical practitioners should be cautious about prescribing dietary fluoride supplements to preschool-aged children in nonfluoridated areas who consume large quantities of carbonated soft drinks.

Dental study admits that "it is not possible for consumers or health care professionals to estimate directly the amount of fluoride ingested from carbonated beverages."

This would also apply to hundreds of other items in the food and beverage chain and other sources, which add to total fluoride intake and accumulation in the body.

The cautions for dental and medical practitioners in over-dosing populations with fluoride would also apply to legislative bodies.

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Although listing fluoride content on beverages would be desirable, it is difficult when not only sites of production, but also water sources at the same production site, may change. If product labels do not provide information on fluoride concentrations or at least the production site, it is not possible for consumers or health care professionals to estimate directly the amount of fluoride ingested from carbonated beverages. An added complicating factor is the consumption of fountain drinks, which are made with water provided by the store or restaurant.

(over)

# Sodas contain a lot of flouride

By Lee Bowman  
Scripps Howard News Service

**M**oms have carped for generations: "Don't drink so much soda pop, the sugar will rot your teeth."

But dental researchers in Iowa say they've found another threat in soft drinks besides sugar: significant levels of fluoride that might themselves contribute to deformed teeth in some youngsters.

In the November issue of the Journal of the American Dental Association, researchers from the University of Iowa said 71 percent of more than 300 soft drinks they tested contained fluoride levels of more than 0.60 parts per million, which is within the recommended range.

"We're not encouraging anyone to have their kids drink less milk or water and more soft drinks on the basis of this study," said lead author Judy Heilman, a scientist at the Dows Institute for Dental Research at the university. "But they need to be aware of these kinds of concentrations when considering the total fluoride dose their children might be getting."

While not enough fluoride may boost cavities down the road, too much of the decay-fighting element can lead to dental fluorosis, a failure of the tooth enamel to crystallize

properly in permanent teeth.

Children from 6 months to 12 years of age are most likely to develop the condition, and intake of fluoride is especially important to monitor in preschoolers whose permanent teeth are most susceptible to remineralization of the tooth enamel. That's why dentists caution that young children should use only small dabs of toothpaste and brush under adult supervision.

Effects can range from chalky, opaque blotching of the teeth, to severe rust-colored stains, surface pitting and tooth brittleness.

"There's no labeling of fluoride content on these drinks, and, in fact, we found a lot of variation in the content depending on where it was produced and bottled, even within the same company for the same product," Heilman said.

Of 332 cans and bottles bought from grocery stores around Iowa, fluoride concentrations ranged from 0.02 ppm to 1.28, with an average level of .72.

The U.S. Public Health Service says the optimal concentration of fluoride in water to prevent decay is 0.7 to 1.2 ppm.

So while the levels were within recommended bounds, "they're something dentists and other practitioners should keep in mind when they consider whether to prescribe fluo-

ride supplements for young children," Heilman said.

Drops or tablets are often recommended for youngsters who for some reason don't drink much water or live in a home or community that gets water from a well or other source that's not fluoridated.

"Surveys indicate that children have increased their intake of carbonated beverages in recent years. About 12 percent of children aged 2 to 5 consume nine or more ounces of carbonated drinks a day," Heilman said. "If this trend continues, it could be that fluoride concentrations in soft drinks would become an increasingly important factor in total fluoride exposure."

The study, supported by grants from the National Institutes of Dental and Craniofacial Research, is part of a larger effort to study fluoride sources and concentrations in children as they grow.

In a 1995 study, Dr. Steven Levy and colleagues at the Iowa institute looked at the fluoride content of fruit juices and found that most were fairly low, with the exception of some grape juices made in a process that included the skins of grapes. Those products had concentrations of up to 7.7 parts per million, apparently due to residue from insecticides and fungicides.

(over)

# **RISK OF FLUOROSIS IN A FLUORIDATED POPULATION - IMPLICATIONS FOR THE DENTIST AND HYGIENIST**

D G Pendrys  
Farmington, Connecticut, USA

Abstract from *Journal of the American Dental Association* 126 (12) 1617-1624 1995

The prevalence of enamel fluorosis has increased in optimally fluoridated areas in recent years. This has led to efforts to identify the cause or causes and to make recommendations that seek to maintain the caries-preventive effectiveness of fluoride use while minimizing the risk of fluorosis. In this study, the author estimated the potential direct impact that dental practitioners could have on reducing the amount of enamel fluorosis in U.S. children. The findings suggest that dental practitioners could have an important impact on reducing the prevalence of enamel fluorosis by guiding the public toward the most appropriate use of fluoride products.

Key words: Dental caries; Dental fluorosis; Fluoridation; Supplements; Toothpaste.  
Reprints: D G Pendrys, Department of Behavioral Sciences and Community Health, School of Dental Medicine, University of Connecticut Health Center, Farmington 06030, USA.

## **FLUORIDE SUPPLEMENT USE BY CHILDREN IN FLUORIDATED COMMUNITIES.**

D G Pendrys and D E Morse  
Farmington, Connecticut, USA

Abstract from *Journal of Public Health Dentistry* 55 (3) 160-164 1995

**OBJECTIVES:** The purpose of this study is to describe patterns of inappropriate fluoride supplementation among a sample of Connecticut schoolchildren living in optimally fluoridated areas. **METHODS:** Fluoride exposure histories were obtained via a written questionnaire with a response rate of 89 percent and an overall reliability of 87 percent agreement. **RESULTS:** A total of 575 subjects lived the entire first eight years of life in a fluoridated community. Of these, 26.1 percent had a history of inappropriate supplementation sometime during that period, including 31.8 percent of subjects with mild to moderate fluorosis and 22.8 percent of subjects without fluorosis. There were no significant supplement history differences related to current age, sex, or socioeconomic status. Overall, 71 percent of these subjects used only vitamins with fluoride, while only 14 percent were reported to have used fluoride supplements alone. Sixty-eight percent of the subjects who were supplemented while breast feeding, continued supplementation after cessation of breast feeding. **CONCLUSIONS:** These findings reinforce the need for health professionals to be targeted more aggressively at the school, residency, and private practice levels to better promote a full understanding of the proper utilization of fluoride supplements.

Key words: Dental fluorosis; Fluoridation; Supplements.  
Reprints: D G Pendrys, Department of Behavioral Sciences and Community Health, School of Dental Medicine, University of Connecticut Health Center, Farmington 06030, USA.

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The first of our abstracts from the dental literature is interesting for its acknowledgement: "The optimal level of fluoride intake has never been determined scientifically and has been used only in general terms." The authors observe also: "Local and regional studies in the United States and Canada have found the prevalence of mostly mild dental fluorosis to range from about 20 to 80 percent." In their concluding discussion they state: "With the majority of children having much less decay than in the past, with diverse sources and variable quantities of ingested fluoride and with the role of systemic fluoride understood to be less important than previously believed, decisions about use of dietary fluoride supplements are more complex than they were in the past." Nonetheless, the continued advocacy in the dental literature of slow-release fluoride from dental filling materials (to achieve a topical effect), and of salt and milk fluoridation, indicate tardy professional recognition of the need to reduce systemic fluoride intake to avoid toxic consequences. JC

### INFANTS FLUORIDE INGESTION FROM WATER, SUPPLEMENTS AND DENTIFRICE

S M Levy, F J Kohout, M C Kiritsy, J R Heilman and J S Wefel  
Iowa City, Iowa, USA

Abstract from *Journal of the American Dental Association* 126 (12) 1625-1632 1995

Concerns about dental fluorosis and the paucity of detailed fluoride intake data prompted this longitudinal study of fluoride intake in infants from birth to 9 months of age. On average, water fluoride intake greatly exceeded that from dietary fluoride supplements or fluoride dentifrice. However, fluoride supplements and dentifrice contributed substantial proportions of fluoride intake among children using them. Some children had estimated fluoride intake from water, supplements and dentifrice that exceeded the recommended "optimal" intake (a level that has yet to be determined scientifically). Practitioners should estimate fluoride ingestion from all these sources if considering systemic fluoride supplementation.

Key words: Dental fluorosis; Dentifrice; Fluoride ingestion; Infants; Optimal Intake; Toothpaste; Water fluoride.

Reprints: S M Levy, University of Iowa, College of Dentistry, Department of Preventive and Community Dentistry, Iowa City, IA 52242, USA.

Also published:

INFANTS' FLUORIDE INTAKE FROM DRINKING WATER ALONE, AND FROM WATER ADDED TO FORMULA, BEVERAGES, AND FOOD by S M Levy, F J Kohout, N Guha et al in *Journal of Dental Research* 74 (7) 1399-1407 1995. Reprints: S M Levy, University of Iowa, College of Dentistry, Department of Preventive and Community Dentistry, Iowa City, IA 52242, USA.

SURVEY OF LEAD, CADMIUM, FLUORIDE, NICKEL, AND COBALT IN FOOD COMPOSITES AND ESTIMATION OF DIETARY INTAKES OF THESE ELEMENTS BY CANADIANS IN 1986-1988 by R W Dabeka and A D McKenzie in *Journal of AOAC International* 78 (4) 897-909 1995. Reprints: R W Dabeka, Department of Health and Welfare, Health Protection Branch, Food Directorate, Bureau of Chemical Safety, Division of Food Research, Ottawa, ON K1A 0L2, Canada.

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## Trends in prevalence of dental fluorosis in North America.

Clark DC



Faculty of Dentistry, University of British Columbia, Vancouver, Canada.

This review of the literature was undertaken to demonstrate the changing trends in the prevalence of dental fluorosis in North America. Using Dean's early work to establish a baseline for the prevalence of dental fluorosis, results of more recent prevalence surveys were used to establish a range for the occurrence of dental fluorosis today. These results suggest that the prevalence of dental fluorosis now ranges somewhere between 35% and 60% in fluoridated communities and between 20% and 45% in nonfluoridated areas, depending on the influence of different local conditions. While the increase has occurred primarily in the very mild and mild categories of dental fluorosis, there is also some evidence that the prevalence is increasing in the moderate and severe classifications as well.

### Publication Types:

- Review
- Review, tutorial

PMID: 8070241, UI: 94349735

 the above report in **Macintosh** **Text** format  
 documents on this page through Loansome Doc

## STARTLING NEW EVIDENCE OF FLUORIDE'S TOXICITY.

Report on the 22nd Conference of the International Society for Fluoride Research

August 23-27, 1998, Bellingham, Washington.

by Paul Connert

While at the conference, I was able to get full length videotaped interviews with several of the scientists who presented papers, and after editing I will be making them available to our readers. We will keep you posted. A number of papers were presented on the toxicity of fluoride which underline the folly of putting this problematic substance in the public water supply. Abstracts of the papers presented at the conference have been published in the most recent issue of the journal Fluoride (address: 81A Landscape Road, Mount Eden, Auckland 1004, New Zealand).

**52-week rat study finds damage to the brain.** Dr. Karl Jensen (a U.S. EPA neurotoxicologist) reported the details of his work with Isaacson's team at the State University of New York in Binghamton, in which long term studies (52 weeks) with rats were performed in which they compared animals given fluoride in the form of aluminum fluoride ( $AlF_3$ ) and others given sodium fluoride ( $NaF$ ). In both cases the fluoride concentration was the same: 1 ppm, which is the level at which water is fluoridated. In both cases they observed damage to brain structures compared to controls. They also found that there was uptake of the aluminum into the brain, for both the aluminum fluoride and the sodium fluoride treated rats. The latter probably took up the aluminum from their chow. It would appear that the fluoride is facilitating the uptake (i.e. the transport across the blood brain barrier) of aluminum into the rat brain. It may be doing this by forming a neutral complex with the aluminum which is fat soluble, or there may be some other fluoride induced mechanism which may be damaging the blood brain barrier. Jensen stressed that the kidneys also were damaged in this experiment and maybe it was this which led to the compromise of the blood brain barrier. What is alarming is that all of these effects were observed at the fluoride level used in our drinking water. The only difference in this experiment is that distilled water was used which meant that the fluoride was not accompanied by calcium or magnesium. It is important to note that fluoride forms complex ions with many metal ions, a phenomenon which might cut both ways. In some cases the complex may prevent the take up of fluoride into tissues and with others it may facilitate it. We need more work like this which investigates the impact of fluoride in the presence of other metal ions (toxic and non-toxic). This work was published in Brain Research (1998), Volume 784, pages 284-298. (See Waste Not # 429). Also reported in Chemical and Engineering News, April 27, 1998, page 29.

**Rat study finds fluoridated steroid used to treat childhood leukemia causes hyperactivity.** Dr. Phyllis Mullenix, whose earlier work on the impact of fluoride on rat behavior sent shock waves through the dental community (she was sacked from her position as Chairman of the Toxicology department of the Forsyth Dental Center, see Waste Not #373), reported on a second experiment using the same methodology. This time she compared the impact of two steroids used in the treatment of childhood leukemia. The key difference between the two steroids was that one had a fluorine atom in its structure. Her model indicated that this steroid caused behavioral patterns typical of hyperactivity. Today, this is the steroid of choice in the treatment of childhood leukemia because it is effective at much lower doses. However, a follow up study of the children using the drug for two years indicated a drop of 10 IQ points compared to the non-fluorinated steroid. This study has been submitted to the International Journal of Oncology for publication. There may be several explanations as to why this fluorinated steroid caused an IQ deficit. One disturbing possibility is that it carried fluorine into the brain where it was metabolized to produce free fluoride ions which then interfered with the performance of key enzymes or proteins. This is disturbing because many pharmaceuticals in common use (e.g. Prozac) have fluorine atoms added to their structure to prolong their time in the tissues before they get broken down into excretable by-products. Fluoride is known to inhibit many enzymes in test tube experiments, but it is argued by pro-fluoridationists that it does not reach damaging concentrations in soft tissue like the brain, but rather gets stored in the teeth and the bones, or gets excreted through the kidneys. However, these fluorinated drugs may transport fluorine and thence fluoride, to places it would otherwise not reach.

**Fluoride concentrates in the pineal gland and significantly reduces melatonin production.** The view that fluoride might not reach soft tissues at significant concentrations received another blow from the work presented by Dr. Jennifer Luke from the UK. She presented her work on the pineal gland. This small gland, which performs many regulating activities including the production of melatonin, is located between the two hemispheres of the brain. It is outside the blood brain barrier and it receives a heavy blood supply, second only to the kidney. It is also a calcifying tissue. Analysis of pineal glands extracted from human cadavers indicate a huge concentration of fluoride in the calcified deposits. The concentrations of fluoride in the hydroxyapatite were 8900 +/- 7700 ppm, and went as high as 21,000 ppm, which is even higher than the bone levels of individuals suffering from skeletal fluorosis. The homogenized tissue had an estimated level of 300 ppm, again suggesting a massive concentration in this small gland. Luke examined the impact of fluoride exposure on melatonin production in Mongolian gerbils. She compared two groups of animals. One group was fed a low level of fluoride in their chow (7 ppm) and the other a high level (37 ppm). The high level groups also received a supplement in their water in the first few days after birth to simulate bottle feeding in infants. Luke found a significant decrease in melatonin production in both the females and males in the high dose group (suggesting an inhibition of one of the four enzymes involved in the conversion of the amino acid tryptophan to melatonin) and a corresponding earlier onset of puberty. Luke is currently proposing to investigate the melatonin levels and the age of onset of puberty in women from India, from areas of both high and low fluoride levels. Some of Dr. Luke's work on the pineal gland previously appeared in the journal Caries Research, Volume 28, page 204 (1994).

**Study finds correlation between blood lead levels in children and the use of silicofluorides in fluoridation.** The most startling presentation came from Roger Masters (Professor of Government at Dartmouth College) and Myron Kaplan (a chemical engineer from Massachusetts). In their study they found a positive correlation of the blood lead levels of 280,000 children in Massachusetts and the use of silicofluorides in the public water supply (International Journal of Environmental Studies, in press). Silicofluorides, either in the form of hexafluorosilicic acid or its sodium salt, are the chemicals most commonly used in the US to fluoridate the water. Masters cited the work of Deborah Denno on a strong correlation between a child's blood lead level at 7 years of age and violent crime at 22. It is not surprising- but very disturbing- that the use of silicofluorides to fluoridate water also correlates with the incidence of violent crime. This was further confirmed in statistics from Georgia. It is not clear whether the silicofluorides are facilitating the dissolution of lead from pipe joints, or simply increasing the transport of the lead from the gut into the bloodstream, or both. Surprisingly, no toxicological studies on animals have been conducted with silicofluorides. The fluoride used in animal experiments is usually sodium fluoride. Kaplan explains that the conversion of silicofluorides to free fluoride is a complicated process and is almost certainly incomplete by the time the water reaches the user. In fact when scientists at waterworks analyze for fluoride content on water treated with silicofluorides, they have to boil the water for 15 minutes at pH 9 to liberate the free fluoride.

**Lead levels dropped in two community water systems when fluoride was discontinued.**

**Thurmont, Maryland:** When the town of Thurmont banned fluoride on Feb. 2, 1994, the local newspaper reported the following. "Lead levels in town water have decreased significantly since town officials stopped adding fluoride, commissioners reported at Wednesday's meeting. They also voted to officially ban the use of fluoride." The town used hydrofluosilicic acid "and town officials believe the acid washes lead from pipe soldering, said Mayor Terrence Best. When commissioners first had town water tested in 1992, some houses had 50 times the accepted limit established by the U.S. [EPA] and the average amount measured twice the limit, he said. Commissioners then stopped using fluoride. The suggested lead limit in water is 15 parts of lead per billion. A May 1993 test showed decreasing levels of lead in water. The high was 130.25 parts per billion, and the average was 9.26 parts per billion. A third test, conducted in November, found the high at 31.95 ppb and the average at 7.11 ppb." ("Fluoride banned in Thurmont, Maryland," by Julia Robb, Frederick Post, Frederick, Md., Feb 3, 1994, page A-9.)

**Tacoma, Washington:** Lead levels dropped from 32 ppb to 17 ppb when the Tacoma Public Utilities temporarily discontinued using fluoride in the public water system due to a drought in the summer of 1992. (Ref: Dec 2, 1992 letter from C.R. Myrick, Water Quality Coordinator, Tacoma Public Utilities, Tacoma, Washington, to Michael Heath, Dept. of Health, Division of Drinking Water, Olympia, Washington.) Tacoma uses sodium fluoride to fluoridate its drinking water.

**Note:** Earth Island Journal, in it's Summer 1998 issue (Vol. 13, #3), published several articles on the fluoride issue. This series of articles are now available in a "Special 16-page Report," which we are including with this newsletter mailing. Earth Island Journal is an excellent publication. It is published by Earth Island Institute, which was founded in 1982 by David Brower. Address: 300 Broadway, Rm. 28, San Francisco, CA 94133. Tel: 415-788-3666. Sub. rate: \$25 individual; \$35 org.

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# AMERICA: OVER-DOSED ON FLUORIDE

Compiled by Lynn Landes and Maria Bechis, Chair & Vice Chair, Fluoride Committee, PA Sierra Club, March 14, 1997

The widespread and uncontrolled use of fluoride in our water, food, juices, soft drinks, beverages, and dental products is causing pervasive over-exposure to fluoride in the U.S. population. Most developed countries have banned fluoride in water. Today, over 60% of the United States population drink fluoridated water. In general, Americans are not warned of the risks of fluoride. Food and beverage labels do not include fluoride concentrations.

Fluoride is the only chemical added to U.S. municipal water that is used to mass medicate, rather than to render water safe to drink. It is not an essential nutrient. It has never received "FDA Approval" (U.S. Food and Drug Administration) as safe or effective. It is listed as an "unapproved new drug." Although fluoride can occur naturally in some water supplies, the type of fluoride added to water is a hazardous waste of the aluminum, uranium, and phosphate fertilizer industries.

For two consecutive years, 1995 & 1996, The Journal of the American Dental Association (JADA) has published studies reporting on pervasive over-exposure to fluoride due to *"the widespread use of fluoridated water, fluoride dentifrice, dietary fluoride supplements and other forms of fluoride...[There is] an increased prevalence of dental fluorosis, ranging from about 15% to 65% in fluoridated areas and 5% to 40% in non-fluoridated areas in North America."* The 1996 study warned parents to limit their children's intake of juices due to excessive fluoride content.

Fluorosis is symptomatic of an over-exposure to fluoride throughout the body. Its visible characteristics are the discoloration or pitting of the teeth. White flecks in the teeth may also occur. *Fluorosis* can lead to tooth decay. FDA's claim that *fluorosis* is only a "cosmetic" effect is unsubstantiated. Fluoride accumulates throughout the body, over an individual's lifetime. It effects all age groups with both long and short-term harmful health consequences.

In 1993, U.S. Dept. of Health and Human Services (HHS) stated in its Toxicological Profile on fluoride (TP 91/17), *"Existing data indicate that subsets of the population may be unusually susceptible to the toxic effects of fluoride and its compounds. These populations include the elderly, people with deficiencies of calcium, magnesium and/or vitamin C, and people with cardiovascular and kidney problems ...Postmenopausal women and elderly men in fluoridated communities may also be at increased risk of fractures."*

Is there a margin of safety for exposure to fluoride? In the 1940's, when *fluoridation* of municipal water began, the "optimal" level of exposure to fluoride for *dental benefit* was determined to be 1 milligram/day. Even at the 1 mg/day exposure level, 10% of the population was expected to *suffer dental fluorosis*. It was estimated that individuals drank 1 liter of water per day. At that time, other sources of fluoride were scarce.

In 1986, the EPA set new "*maximum contaminant levels (MCLs)*" for fluoride. Above 2 mg/liter "children are likely to develop objectionable *dental fluorosis*" and parents must be officially notified. Above 4 mg/liter, individuals are at risk of developing "*crippling skeletal fluorosis*". It is against federal law to fluoridate water above 4 mg/liter.

Below is a summary and analysis of a HHS table that estimates *fluoride exposure levels from food, beverages, toothpaste, and mouthwash* (U.S. Dept. of Health and Human Services, Review of Fluoride Benefits and Risks, 1991).

<u>Fluoride Concentration in Drinking Water</u>		<u>Fluoride Intake</u>	<u>% Over 1 mg "Optimal" Dose</u>
Unfluoridated Communities	< 0.3 mg/L	0.88 - 2.20 mg/day	as much as 120%
"Optimally" Fluoridated	0.7-1.2 mg/L	1.58 - 6.60 mg/day	as much as 560%
Fluoridated communities	> 2.0 mg/L	2.10 - > 7.05 mg/day	possible > 605%

(Table does not include Fluoride supplements, pharmaceuticals, emissions, and workplace exposures to fluoride)

RECOMMENDATION: The FDA should be required to put fluoride through the rigorous "controlled studies" necessary for "FDA Approval." If fluoride gains FDA approval, then it should be treated as a *prescribed medication* in order to protect individuals from over-exposure.

## Citizens for Safe Drinking Water

a not-for-profit ballot measure committee

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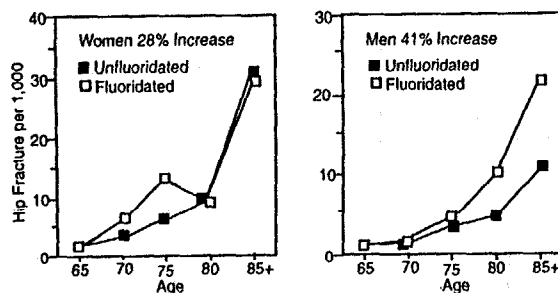
(OVER)

## Fluoride is cancer-causing in rats, mice and humans.

- 1) *Carcinogenesis*, volume 9, pages 2279-2284 (1988)
- 2) *Sodium Fluoride: individual animal tumor pathology table [rats]*, Battelle Memorial Institute, Feb. 23, 1989
- 3) *Sodium Fluoride: individual animal tumor pathology table [mice]*, Battelle Memorial Institute, April 11, 1989
- 4) *Lancet* 36, page 737 (1990)
- 5) *Review of Fluoride: Benefits and Risks*, U. S. Public Health Service, pages F1-F7 (1991)
- 6) *Fluoride* volume 26, pages 83-96 (1992)
- 7) *A Brief Report on the Association of Drinking Water Fluoridation and the Incidence of Osteosarcoma among Young Males*, New Jersey Department of Health, November 1992
- 8) *Fluoride, the Aging Factor*, Health Action Press, pages 72-90 (1993)

## Hip fracture rates are much higher in people residing in fluoridated communities.

Graph from reference 3 below Daineilson et al.



- 1) *Journal of the American Medical Association* volume 264, pages 500-502 (1990)
- 2) *Journal of the American Medical Association* volume 266, pages 513-514 (1991)
- 3) *Journal of the American Medical Association* volume 268, pages 746-748 (1992)
- 4) *Journal of the American Medical Association* volume 273, pages 775-776 (1995)

## IMPORTANT FLUORIDE FACTS

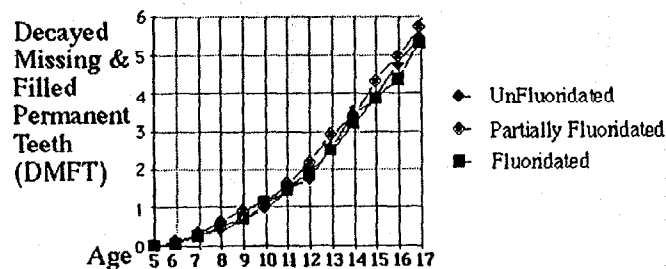
The U.S. National Research Council admits that dental fluorosis (fluoride poisoning of the teeth) affects from 8% to 51% of the children drinking fluoridated water.

- 1) *Science* volume 217, pages 26-30 (1982)
- 2) *Journal of the American Dental Association* volume 108, pages 56-59 (1984)
- 3) *Journal of Public Health Dentistry* volume 46, pages 184-187 (1986)
- 4) *Health Effects of Ingested Fluoride*, National Research Council, page 37 (1993)

Recent large-scale studies show no difference in decay rates of permanent teeth in fluoridated and non fluoridated areas.

- 1) *Community Health Studies* volume 11, pages 85-90 (1987)
- 2) *Journal of the Canadian Dental Association* volume 53, pages 763-765 (1987)
- 3) *Fluoride* volume 23, pages 55-67 (1990)

United States 1987 Fluoridation Survey found NO DIFFERENCE in Tooth Decay



(OVER)

Fluoride tablets and drops are not approved by the U.S. Food and Drug Administration as safe or effective.

- 1) Letter from Frank R. Fazzari, Chief, Prescription Drug Compliance, Food and Drug Administration to New Jersey Assemblyman John Kelly (June 8, 1993)
- 2) *Preventing Tooth Decay: Results from a Four-Year National Study*, Robert Wood-Johnson Foundation, Special Report number 2/1983, 18p
- 3) *Community Dentistry and Oral Epidemiology*, volume 19, pages 88-92 (1991)

Fluoride is more toxic than lead, and even in minute doses, accumulates in and is damaging to brain/mind development of children; i.e. produces abnormal behavior in animals and reduces IQ in humans.

- 1) Mullenix, Phyllis et. al Neurotoxicity of Sodium Fluoride in Rats, *Neurotoxicology and Teratology*, Vol. 17, No. 2, pp. 169-177, 1995
- 2) Li, XS; Zhi, JL; Gao, RO Effects of fluoride exposure on intelligence in children, *Fluoride* 28:4, pp. 189-192 (1995)
- 3) Zhao, LB; Liang, D; W Wu Lu-Liang Effects of a high fluoride water supply on children's intelligence. *Fluoride* vol. 29:4 pp. 190-192 1996
- 4) Varner, J.A., et al, Chronic administration of aluminum-fluoride or sodium-fluoride to rats in drinking water; alterations in neuronal and cerebrovascular integrity, *Brain Research*, 78-4; 283-298, 1998; Brain Damage in Rats from Fluoridated Water, *Chemical & Engineering News (C&EN)*, p.29, 4/27/98

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FLUORIDE ISSUES

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